



CRC for Construction Innovation (2005) *Design check : automated code checking.* ☐ ☐

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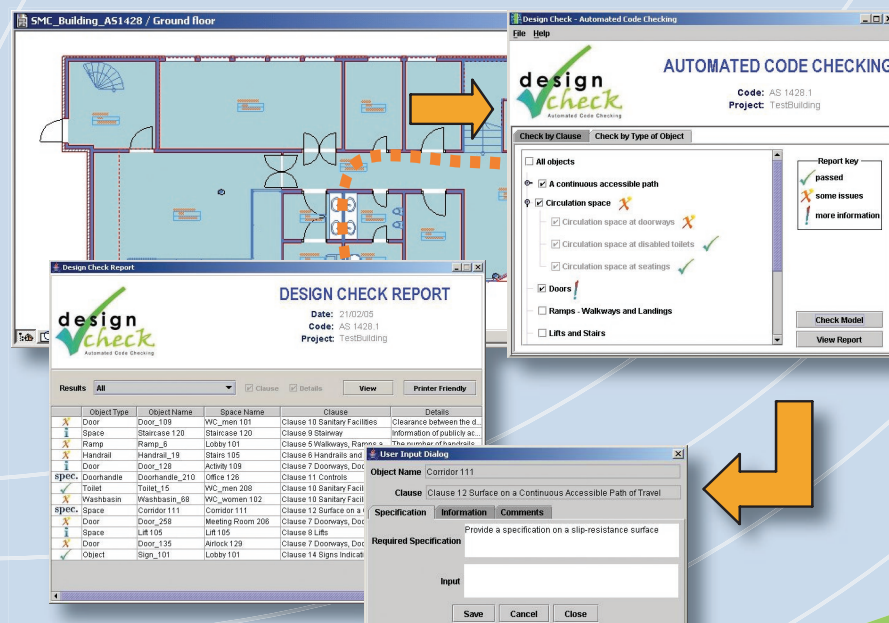


CRC Construction Innovation
BUILDING OUR FUTURE

design check

Automated Code Checking

An advanced computer software tool that provides automated checking of designs against building codes



CRCs bring together researchers from universities, CSIRO and other government laboratories, and private industry or public sector agencies, in long-term collaborative arrangements which support research and development and education activities to achieve real outcomes of national economic, environmental and social significance.



An industry need

Checking building designs for compliance with numerous building code provisions is a complex task with a high cost of failure.

DesignCheck™ provides a software tool for designers and building surveyors to allow quick and easy compliance assessment against building codes. The first code to be implemented is the disabled access code, since access provisions have a higher risk or cost of failure than some other areas of building code provisions. **DesignCheck™** assists designers in identifying potential problems earlier, and building certifiers in automating the checking process to reduce time and cost.

DesignCheck™ can be applied in many areas of the built environment – wherever a compliance standard is established.

Benefits of DesignCheck™

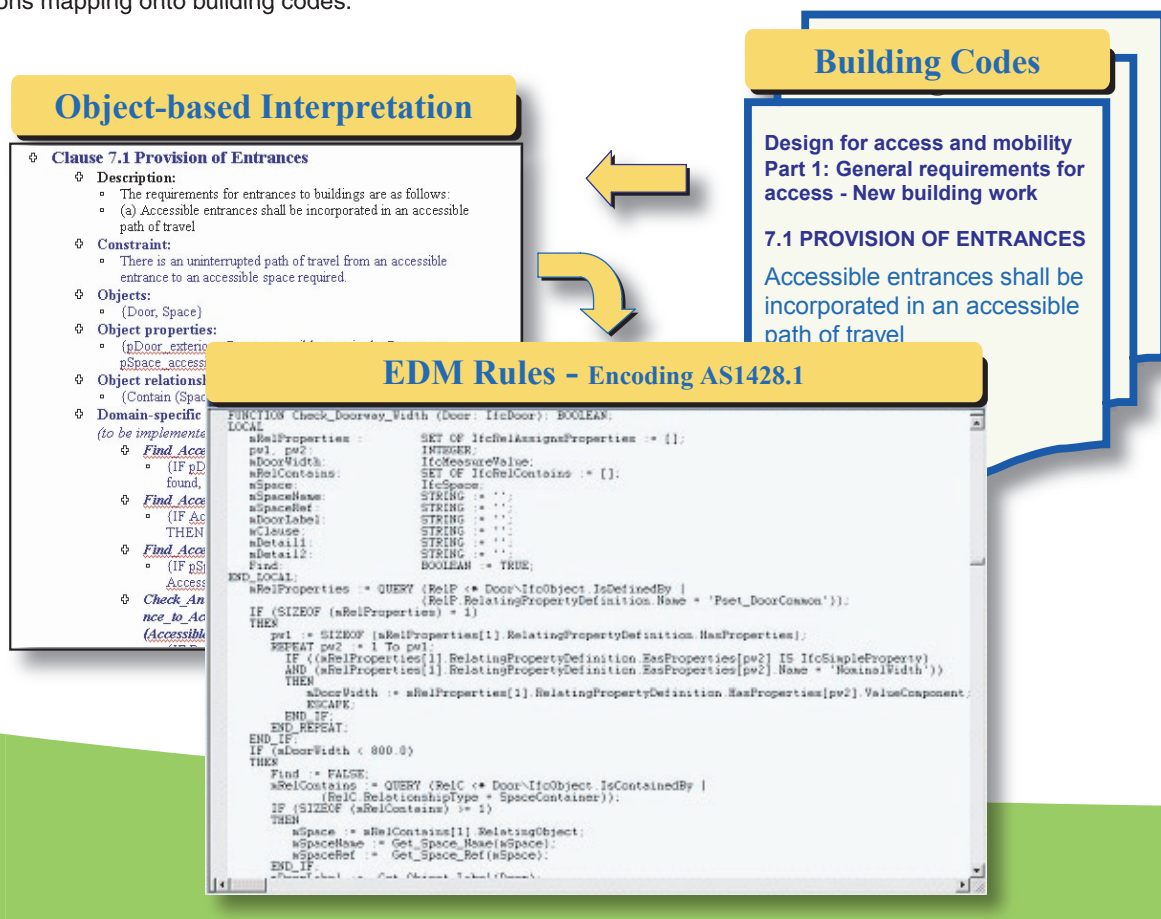
- Automates design checking against codes (disabled access code currently)
- Interrogates 3D object-based CAD systems
- Allows checking at various stages - sketch design, detailed design and specification
- Allows checking of design by building code clauses
- Allows checking of design by building object type
- Provides a friendly and interactive reporting system

Advances in DesignCheck™

DesignCheck™ advances beyond existing tools by providing an automated checking process, an object-based rule system, as well as a central database for data sharing and communication with other applications.

DesignCheck™ demonstrates an automated checking process comprising: importing building models into a central database, checking building models against individual clauses within a building code, or alternatively checking individual object types or groups of objects rather than the entire building model. Once checking is completed the interactive reporting interface appears to the user, which offers a variety of view options and enables the user to view results by “All”, “Compliance”, “Non-compliance”, “Specification required” and “Unsolved compliance” and input the required specifications of objects.

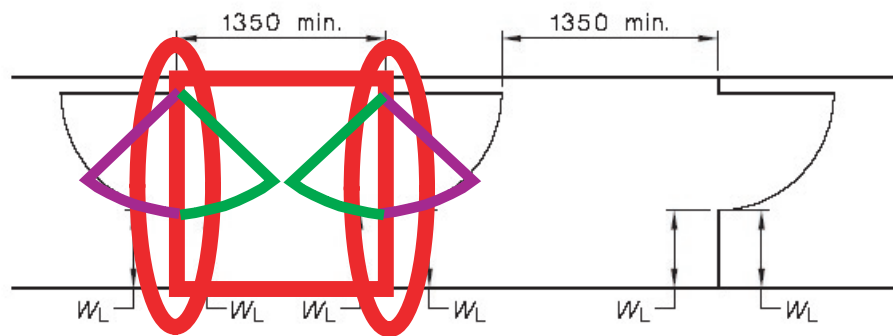
DesignCheck™ also shows flexibility in modelling extended design information and encoding wider domain knowledge. It defines a new model schema for building models that contains comprehensive design information as well as identical descriptions mapping onto building codes.



Technology of DesignCheck™

- Uses Industry Foundation Classes (IFCs)¹ as an intermediate model for translating 3D object-based CAD models into Code Check Internal Model
- Provides a geometry engine for supporting design performance verification

Example Application of DesignCheck™



LEGEND:

W_L = Width—latch side (see Figures 12(c) and 12(g) and Figure 13(a))

DIMENSIONS IN MILLIMETRES

Impact of DesignCheck™

- Provides a generic tool to automate compliance checking against building codes for all stages of design (starting with the disabled access code)
- Assists in design automation for the construction industry

Likely users of DesignCheck™

- Architects/designers
- Building certifiers/consultants
- Building Code authorities
- Design specification writers

¹ IFCs have been developed by the International Alliance for Interoperability (IAI), a non-profit global alliance of building, construction and software industries with over 650 member organisations in 20 countries. Interoperability enables participants to share common project information across disciplines and technical applications (www.iai-international.org).

CRC for *Construction Innovation*

DesignCheck™ has been developed by the Australian Cooperative Research Centre (CRC) for *Construction Innovation*. *Construction Innovation* is a national research development and implementation centre focussed on the needs of the property, design, construction and facility management sectors. It takes ideas and turns them into collaborative research to produce industry-relevant results for our partners and the whole industry.



Partners in progress

DesignCheck™ is supported by Building Commission Victoria, ABCB, Woods Bagot, the Commonwealth Scientific and Industrial Research Organisation (CSIRO) and University of Sydney



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